Oxy-Gasoline Torch Deployment

Accelerated Site Technology Deployment
Integrated Decontamination and Decommissioning Project

Need

Numerous surplus facilities within the DOE complex need to be decontaminated and decommissioned to reduce maintenance and surveillance costs as well as the impact to the environment and workers. Many of these facilities contain large amounts of carbon steel equipment and piping that must be cut up for disposal.

Technology Description

The Oxy-gasoline torch, manufactured by Petrogen Inc., is a tool for cutting carbon steel. Fueled by gasoline, it can be used as a direct replacement for the standard oxy-acetylene torch. The Oxy-gasoline torch consists of a two-and-a-half gallon fuel tank with safety valves, a durable gasoline supply hose, and a cutting torch head. A built-in hand pump or an external source of compressed air pressurizes the gas tank. About 10 to 20 pounds per square inch of pressure is required to deliver the gas to the head of the torch, where it mixes with oxygen in the tip.

Safety was a primary consideration in the torch's design. Since liquid gasoline cannot burn and the fuel is a liquid all the way to the cutting tip, there is no chance of backflash in the fuel line. The design also includes several safety valves. A fast-flow check valve in the tank shuts off the fuel in case the hose ruptures. The tank comes equipped with a pressure relief valve that opens at 35 pounds per square inch and check valves under the pressure gauge and inside the outlet valve that prevent fuel from escaping if the gauge or valve is accidentally broken off. In contrast to acetylene, gasoline will not burn or explode if exposed to heat or shock. Acetylene can actually explode without an oxygen source.

The Oxy-gasoline torch cuts faster than conventional torches. Gasoline is 100% oxidizing so it burns and blows metal through rather than melting it, producing clean cuts with minimal kerf. This reduces the need for secondary cuts to remove metal that has re-solidified and resealed the cut.

Benefits

The Oxy-gasoline torch has many advantages over the acetylene torch:

- It cuts faster and cleaner with less slag.
- It uses fuel that is less expensive (equivalent cuts can be made with $3.00 of gasoline versus $50.00 of acetylene), and is easy to obtain and store.
- It is more portable (fuel tank weighs 30 pounds compared with the 250-pound acetylene tank).
- It reduces cost, accelerates schedule, and reduces radiation exposure.
- Gasoline evaporates in the tip, cooling it and increasing tip life.

Status

The Oxy-gasoline torches purchased under the Accelerated Site Technology Deployment Integrated Decontamination and Decommissioning (ASTD ID&D) project were first deployed at the INEEL in July of 1998. The deployment was at Central Facilities Area 691, where the torches were used to cut up rebar during the dismantlement of a concrete digester tank. Throughout the summer of 1999, the torches have been used at a number of facilities. These facilities include the Security Training Facility, Sewage Treatment Plant, Initial Engine Test Facility, and Auxiliary Reactor Area. The torches work extremely well. Operators commented that they are easier to move around and cut more quickly than an acetylene torch, especially with thick metal such as railroad track. The operators liked the torches so much that they used them at different areas on their own initiative. The Oxy-gasoline torch is fast becoming the baseline at the INEEL.

Contacts

Harold Shoemaker, Federal Energy Technology Center, (304) 285-4715, hshoem@doe.fetc.gov

Dick Meservey, Idaho National Engineering and Environmental Laboratory, (208) 526-1834, rhm@inel.gov

Milt Heft, Petrogen, (510) 237-7274, petrogen.com

Modified 9/2/99